

## REMARKS

Claims 13-15 and 27 are pending and rejected in the present application.

Claim 15 is amended hereby.

Applicants acknowledge the withdrawal of the finality of the previous Office Action in response to the Amendment and Request for Continued

5 Examination under 37 CFR 1.114 filed 27 February 2004.

The Examiner rejected claims 13-15 under 35 U.S.C. §112, first paragraph. More particularly, in thus rejecting claims 13-15 the Examiner characterizes the term "wave front" as subject matter which was not described in the specification "in such a way as to reasonably convey to one skilled in the

10 relevant art that the inventors, at the time the application was filed, had possession of the claimed invention". Applicants respectfully traverse.

The fundamental factual inquiry under 35 U.S.C. §112, first paragraph, is to determine whether the specification conveys with reasonable clarity to those skilled in the art that, as of the filing date sought, applicant was in possession of 15 the invention as now claimed. See, e.g., *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1563-64, 19 USPQ2d 1111, 1117 (Fed. Cir. 1991). What is conventional or well known to one of ordinary skill in the art need not be disclosed in detail.

See *Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d at 1384, 231 USPQ at 94, *Emphasis Added*. If a skilled artisan would have understood the inventor

to be in possession of the claimed invention at the time of filing, even if every nuance of the claims is not explicitly described in the specification, then the adequate description requirement is met. See, e.g., *Vas-Cath*, 935 F.2d at 1563, 19 USPQ2d at 1116; *Martin v. Johnson*, 454 F.2d 746, 751, 172 USPQ 391, 395 5 (CCPA 1972)(Emphasis Added).

A wave front is an inherent characteristic or feature of every wave. Disclosure of a wave discloses all the characteristics inherent to a wave, just as disclosure of an electrical current discloses the movement of electrons brought about by a potential difference. Applicants submit the fact that every wave has a 10 “wave front” is well known to any person who has at one time or another had the opportunity to informally observe the propagational behavior of a simple wave, whether in an ocean or a ripple in a puddle. Applicants further submit that anyone having even a rudimentary background in science intuitively understands that a wave has a wave front. Moreover, the term “wave front” is defined in many 15 dictionaries. For example, the online version of the Merriam Webster dictionary defines the term “wave front” as: a surface composed at any instant of all the points just reached by a vibrational disturbance in its propagation. See, <http://www.m-w.com/cgi-in/dictionary?book=ictionary&va=wavefront>.

Since the concept that every wave has a wave front is well known to even 20 the casual observer, and is certainly well known to one skilled in the art, and since the original disclosure adequately disclosed the presence of waves, Applicants

submit that the term wave front need not be defined or disclosed in any detail in order to satisfy the description requirement of the first paragraph of 35 U.S.C. §112. Thus, Applicants submit that claims 13 and 15 satisfy the description requirement and are currently in allowable form. Accordingly, Applicants 5 respectfully request withdrawal of the rejection and allowance of claims 13, claim 14 depending therefrom, and claim 15.

In the rejection of claims 13-15 under 35 U.S.C. §112, first paragraph, the Examiner states that if the Applicants intended the recitation 'generally perpendicular to the wavefronts' of claims 13 and 15 to define "a surface that is 10 perpendicular to the direction of the travel of the waves the claims are not enabled because there is not a single direction which is perpendicular to the travel of the waves and the surface which is perpendicular to the direction of the travel of the waves".

Responsive thereto, Applicants respectfully direct the attention of the 15 Examiner to the marked-up version of Fig. 1 attached hereto. The length of the container is in the horizontal (x-axis) direction, the height/depth dimension is in the vertical (y-axis) direction, and the width dimension of the container is in a direction into and/or out of the page of Fig. 1 (the z-axis). The direction of travel of the waves is from the bottom to the top of the container and, for the purposes 20 of Fig. 1, is thus in the vertical or y-axis direction. The wave fronts are therefore oriented in a direction that is generally into and/or out of the paper or in the z-axis

direction. The direction in which the wafers are moved during cleaning is in the horizontal or x-axis direction, i.e., generally perpendicular to the direction of travel of the waves (y-axis) and to the wave fronts (z-axis). Thus, Applicants submit that the wafers are moved in a single direction that is perpendicular to the 5 direction of travel of the waves and to the wave fronts, as recited in part by claims 13 and 15.

Responsive to the objection to the amendment of claims 13 and 15 under 35 U.S.C. §132 as containing new matter, Applicants traverse in part, and have amended claim 15.

10 More particularly, the Examiner rejected claims 13 and 15 on the basis that the term “wave fronts” is not supported by the disclosure. Applicants respectfully traverse for the same reasons given above in response to the rejection of claims 13 and 15 under 35 U.S.C. §112, first paragraph, and request that the rejection be withdrawn. For those same reasons, Applicants submit that 15 claims 13 and 15 are in allowable form and in condition for allowance, which is hereby respectfully requested.

Responsive to the rejection of claim 15 on the basis that the wafers being at least partially disposed in the cleaning solution was not supported by the original disclosure, Applicants have amended claim 15 keeping in mind the 20 comments offered by the Examiner. Applicants submit that claim 15 is now in

allowable form and in condition for allowance, which is hereby respectfully requested.

Claim 15 stands rejected under 35 U.S.C. §102(b) being anticipated by any one of U.S. Patent Nos. 5,849,091 and 6,048,045 (collectively referred to 5 hereinafter as the Skrovan, et al., patents). Responsive thereto, Applicants respectfully traverse.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 10 USPQ2d 1051, 1053 (Fed. Cir. 1987)(Emphasis Added). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989)(Emphasis Added). Applicants submit that the Skrovan, et al., patents do not disclose the identical invention in as much detail as is contained in claim 15, 15 nor do those patents disclose each and every element as set forth in claim 15.

The Skrovan, et al., patents disclose a megasonic wafer cleaning apparatus 10 (Fig. 1 and 2) including wafers 11 in a tank housing 12 containing cleaning solution 13. Megasonic transducers 24 generate standing megasonic waves 26. Gas feed line 34 provides gas to gas injection device 30, which 20 generates gas bubbles 36 below the wafers so as to rise up and across the surfaces of the wafers and to the surface of the cleaning solution 13.

In contrast, claim 15 recites in part “intercepting the generated waves . . . between one or more sources of the megasonic waves and the holder, and dispersing the waves in a divergent manner” and “exposing the semiconductor wafers to the dispersed megasonic waves”. (*Emphasis Added*).

5        The Skrovan, et al., patents teach only that the wafers are exposed to gas bubbles in the cleaning fluid. The Skrovan, et al., patents do not teach or disclose intercepting megasonic waves, dispersing such waves, nor exposing the wafers to those dispersed waves. Thus, the Skrovan, et al., patents fail to disclose intercepting the generated waves, dispersing the waves in a divergent 10 manner, and exposing the wafers to the dispersed megasonic waves, as recited in part by claim 15.

Since the Skrovan, et al., patents fail to disclose all the limitations of claim 15, Applicants submit that claim 15 is not anticipated thereby. Accordingly, Applicants request withdrawal of the rejection and allowance of claim 15.

15        In rejecting claim 15, the Examiner asserts in a conclusory manner that the Skrovan patents inherently disclose that the generated waves would be intercepted and dispersed by part 34 (Fig. 1 and 2) and by gas bubbles 36. Applicants submit that the Skrovan, et al., patents make no such disclosure, inherently or otherwise, and that therefore an improper standard of inherency has 20 been applied in rejecting claim 15.

To establish inherency, the extrinsic evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The 5 mere fact that a certain thing may result from a given set of circumstances is not sufficient. See *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999). Further, when relying upon the theory of inherency, the Examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily 10 flows from the teachings of the applied prior art. *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990)(Emphasis Added).

There is no extrinsic evidence of record that supports the assertion that the part 34 intercepts and disperses megasonic waves. Nor is there any evidence of record that the wafers of the Skrovan, et al., patents are exposed to 15 dispersed waves. In fact, the extrinsic evidence of record, i.e., the Skrovan, et al., patents, contradict such an assertion. The Skrovan, et al., patents disclose that part 34 can be located on, for example, the bottom wall or any end wall of the tank. The Skrovan, et al., patents therefore disclose that the position of part 34 is not critical and that therefore part 34 need not be positioned to intercept 20 and/or deflect waves. (see column 6, lines 1-9). Thus, the Skrovan, et al.,

indicate that the interception and/or dispersion of the generated waves are not necessary.

Since the Skrovan, et al., patents fail to make clear that the megasonic waves are must be intercepted and dispersed, and that the wafers are exposed 5 to those dispersed waves, Applicants submit that an improper standard of inherency has been applied in rejecting claim 15. Accordingly, Applicants submit that claim 15 is in condition for allowance, and respectfully request same.

Further, the requirement of claim 15, i.e., that the waves be intercepted, dispersed, and the wafers exposed to the dispersed waves, does not necessarily 10 flow from the teachings of the Skrovan, et al., patents. The mere possibility that the part 34 or bubbles 36 may disperse the waves and that the wafers may be disposed to any such dispersed waves is not a sufficient basis for a rejection based upon inherency.

Claims 13-14 and 27 were rejected under 35 U.S.C. §103(a) as being 15 unpatentable over U.S. Patent No. 6,085,764 (Kobayashi, et al.) in view of Handbook of Semiconductor Wafer Cleaning Technology (HSWCT). Applicants respectfully traverse.

Claim 13 recites in part "moving the wafers in the cleaning fluid through said megasonic waves in a direction that is generally perpendicular to the 20 direction of travel of the megasonic waves and generally perpendicular to the wave fronts of the megasonic waves". (*Emphasis Added*).

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). Applicants submit that the cited references fail to disclose or suggest, alone or in combination, the limitations of claim 13 and 5 that therefore *prima facie* case of obviousness has not been established in regard thereto.

The Examiner asserts that Kobayashi, et al., discloses moving the wafers in the same direction as the present invention. Applicants respectfully point out, however, that Kobayashi, et al., discloses only that the wafers are minutely 10 vibrated in directions that are orthogonal relative to each other. (see *column 2, lines 63-67*). Moving the wavers in directions that are orthogonal relative to, or even simply different from, each other is not the same as moving the wafers in a direction that is determined relative to or based upon the cleaning waves.

More particularly, moving the wavers in directions that are orthogonal 15 relative to each other is not the same as limiting the movement of the wafers to a direction that is perpendicular to the direction of travel of the waves and perpendicular to the wave fronts as in the present invention. Kobayashi, et al., references the directions in which the wafers are moved to each other. Kobayashi, et al., does not reference the movements of the wafers to the 20 direction of travel of the cleaning waves nor to the wave fronts as does the present invention. Thus, Kobayashi, et al., does not disclose or suggest moving

the wafers in the cleaning fluid in a direction that is generally perpendicular to the direction of travel of the megasonic waves and generally perpendicular to the wave fronts, as recited in part by claim 13.

For the foregoing reasons, Applicants submit that Kobayashi, et al., fails to 5 disclose or suggest all the limitations of claim 13 and therefore a *prima facie* case of obviousness has not been established in regard thereto. Accordingly, Applicants respectfully request withdrawal of the rejection and submit that claim 13 and claim 14 depending therefrom are in condition for allowance, which is hereby respectfully requested.

10 Claim 27 was also rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,085,764 (Kobayashi, et al.) in view of Handbook of Semiconductor Wafer Cleaning Technology (HSWCT). Responsive thereto, Applicants respectfully traverse.

Claim 27 recites in part "moving the wafers in the cleaning fluid through 15 said megasonic waves in a direction that is generally transverse to the megasonic waves and generally perpendicular to faces of the wafers. As discussed above, Kobayashi, et al., discloses only that the wafers are minutely vibrated in directions that are orthogonal relative to each other. Kobayashi, et al., does not disclose or suggest limiting the direction in which the wafers are moved 20 to a direction relative to the cleaning waves nor does Kobayashi, et al., disclose limiting the direction in which the wafers are moved to a direction relative to the

wafer faces. Thus, Kobayashi, et al., fails to disclose or suggest moving the wafers in a direction that is generally transverse to the megasonic waves and generally perpendicular to faces of the wafers, as recited in part by claim 27.

For the foregoing reasons, Applicants submit that Kobayashi, et al., fails to 5 disclose or suggest all the limitations of claim 27 and that therefore a *prima facie* case of obviousness has not been established in regard thereto. Accordingly, Applicants respectfully request withdrawal of the rejection and submit that claim 27 is in condition for allowance and respectfully request same.

For all the foregoing reasons, Applicants submit that the pending claims 10 are definite and do particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Moreover, Applicants submit that the pending claims are also in condition for allowance. Accordingly, Applicants respectfully request withdrawal of all objections and rejections, and allowance of the claims.



PATENT  
90065.161701(17732.6310.003)  
Response to Office Action of 22 Mar 2004

The Examiner is invited to telephone the undersigned in regard to this  
Amendment and the above identified application.

Respectfully submitted,

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Date



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